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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,683	06/27/2003	Mingqiu Sun	20002/16136X	8306
34431	7590	10/12/2005	EXAMINER	
HANLEY, FLIGHT & ZIMMERMAN, LLC			KROFCHECK, MICHAEL C	
20 N. WACKER DRIVE			ART UNIT	
SUITE 4220			PAPER NUMBER	
CHICAGO, IL 60606			2186	

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/608,683

Applicant(s)

SUN, MINGQIU

Examiner

Michael Krofcheck

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7, 9-36, 38-42 and 44-46 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 8, 37 and 43 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on June 27, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/30/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

*PR*

### **DETAILED ACTION**

1. This office action is in response to application 10/608,683 filed on June 27, 2003.
2. The preliminary amendment to the specification filed on October 3, 2003 has been entered.
3. Claims 1 – 46 have been submitted for examination.
4. Claims 1 – 46 have been examined.
5. This application is in condition for allowance except for the following formal matters:

#### ***Specification***

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

7. The abstract of the disclosure is objected to because the phrase "are disclosed" is used in line 1. Correction is required. See MPEP § 608.01(b).

#### ***Content of Specification***

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606.

- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f).

8. The specification is objected to because the applicant fails to include a Brief Summary of the Invention; section (g) from above.

9. The disclosure is objected to because of the following informalities:

a. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code in paragraph 0029. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Appropriate correction is required.

10. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

11. Claims 8, 37, and 43 are objected to because of the following informalities:

a. With respect to claims 8, 37, and 43, the examiner is unclear of what the applicant is intending to claim. If you are at the program state, the previous program state is by definition the program state right before, then it is impossible to have a program state between them. It is also unclear which of the previously mentioned program states "the program state" refers to. The applicant is advised to clarify his intentions in claims 8, 37, and 43.

Appropriate correction is required.

12. Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

***Allowable Subject Matter***

13. Claims 1 – 7, 9 – 36, 38 – 42, and 44 – 46 are allowed.

14. Claims 8, 37, 43 are allowable if rewritten to overcome their respective objections.

15. The following is a statement of reasons for the indication of allowable subject matter:

a. With respect to claims 1, 13, and all of their respective dependent claims (2 – 12 and 14 – 17), the prior art (Banerjia, U.S. Patent 6,237,065) teaches of identifying program states associated with an executing program (col. 3, lines 37 – 42). Datta, U.S. Patent 6,622,168 teaches of replacing cache lines based upon their navigation probability and their most recent access time (col. 18, lines 1 – 16). Other prior art cited in this correspondence teaches of using least recently used, priority levels, age, least recently created, least frequently accessed, and criteria to determine what to flush from a cache.

The prior art fails to teach of comparing a time of first discovery of a program state to a most recent time of first discovery to determine if the program state is associated with short-lived objects; and if the program state is not associated with short-lived objects and program execution has transitioned to the program state from a program state associated with short-lived objects, flushing the cache of at least one short-lived object.

b. With respect to claim 18 and all of its dependent claims (19 – 32), the prior art (Banerjia, U.S. Patent 6,237,065) teaches of a trace sampler to develop a trace of a program, and a state identifier to identify program states from the trace (col. 3, lines 36 - 62).

The prior art fails to teach of a short-lived object identifier to identify program states associated with short-lived objects based on the times of first discovery of the program states.

c. With respect to claims 33, 39, and all of their respective dependent claims (34 – 38 and 40 – 44), the prior art (Banerjia, U.S. Patent 6,237,065) teaches of identifying program states associated with an executing program (col. 3, lines 37 – 42). Dean et al., U.S. Application Publication 2002/0152361 teaches of a cache age field which is used in conjunction with a threshold to discard and prefetch code lines (paragraphs 0024 – 0025). Sander et al., U.S. Patent 6,571,318 teaches of using multiple confidence thresholds to prefetch different amounts data based upon which threshold is passed (col. 2, lines 5 – 18).

The prior art fails to teach of if an age of a current program state is less than a first threshold and an age of a previous program state is greater than a second threshold, pre-fetching memory objects associated with program states having an age less than a third threshold.

d. With respect to claim 45 and its dependent claim (46), the prior art (Banerjia, U.S. Patent 6,237,065) teaches of a trace sampler to develop a trace of a program, and a state identifier to identify program states from the trace (col. 3, lines 36 - 62). Magoshi, U.S. Patent 6,751,707 teaches of an off-chip cache (col. 1, lines 44 - 52).

The prior art fails to teach of a short-lived object identifier to identify program states associated with short-lived objects based on the times of first discovery of the program states.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Krofcheck whose telephone number is 571-272-8193. The examiner can normally be reached on Monday - Friday.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael Krofcheck



**MATTHEW D. ANDERSON**  
**PRIMARY EXAMINER**